

MISSOURI resources

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Front Cover: The Felix Vallé State Historic Site in Ste. Genevieve reflects the French colonial history of Missouri.

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Cover photo by Scott Myers



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The Business of **Nature**

by Larry Archer

photographs by Scott Myers and Nick Decker

Sitting in his office on the tenth floor of the Jefferson Building in the state's capital city, Steve Townley hardly evokes images of your local bank president - no huge oak desk, no vault in the back room, no works of art on the wall, no free toasters with new accounts.

But to community leaders throughout the state, Townley, financial services section chief of the Department of Natural Resources' Water Pollution Control Program, offers the bank services they need the most - low-interest loans for local water treatment and drinking water projects. Since the start of the State Revolving Fund (SRF) program in 1989, the department, in cooperation with the Environmental Improvement and Energy Resources Authority, has issued loans totaling more than \$1.13 billion to nearly 300 Missouri communities.

"I don't think anybody associates the Department of Natural Resources or this program with a bank that is over a billion dollars strong," Townley said.

"In cooperation with EIERA, the [State Revolving Fund Leveraged Loan Program](#) generates over \$8.50 in construction for every state match dollar," said Karen Massey, deputy director of EIERA.

The State Revolving Fund is not the only source of funding for natural resources-related projects that also have a significant economic impact. The department distributed more than \$141 million in "pass-through" federal funds to local entities during fiscal year 2001.

"Few people realize the degree to which the conduct of our mission contributes to economic development," said Department Director Steve Mahfood. "The construction of the projects we fund have a significant economic impact on the communities where they are located. In addition, things such as nice parks, clean streams and fresh air add tremendously to Missouri's attractiveness as a place to live, work, vacation and do business," Mahfood added.



The Missouri Brownfield Redevelopment Program rehabilitates sites like the Carondelet Coke production plant in south St. Louis.

Lower interest rates offered through the State Revolving Fund have saved communities more than \$350 million over conventional financing, Townley said.

For the city of Cameron, a community of 9,600 northeast of Kansas City, both Clean Water State Revolving Fund and Drinking Water State Revolving Fund projects have been part of the city's economic development efforts, according to City Manager Phil Lammers. Already the home of the Western Missouri Correctional Center, Cameron was on the Missouri Department of Corrections' short list for yet another facility. It was obvious, however, that Cameron's wastewater system could not handle another prison that houses 1,500 inmates.

"We got right to work on options and the SRF played a key role in the finance mechanism. They're considerably lower than what is out there on the commercial market," Lammers added.

Cameron already had used the revolving fund for an earlier loan of \$1 million. Right on the coattails of the \$2.9 million loan from the State Revolving Fund came the prison, Crossroads Correctional Center.

Along with the prison came 470 new jobs and an estimated \$11.9 million in new

payroll. "Into a small town, that's a significant amount of money," Lammers said. In addition to the wastewater projects, the city also took out a \$3.3 million drinking water loan to fund a new treatment plant. After years of having the city's surface water supply considered "at risk" by the U.S. Environmental Protection Agency, the new facility worked to lure prospective companies wishing to locate there.

Finding other communities who want to take advantage of those quality-of-life issues was the driving force behind the establishment of the Department of Natural Resources' new [Community Assistance Office](#) (CAO). Housed within the department's [Outreach and Assistance Center](#), the office will serve as the "portal" through which communities can access financial help with their projects.

"The primary focus of the CAO will be to provide a one-stop shop for anyone who needs financial or other assistance," said Sara Parker, director of the Outreach and Assistance Center.

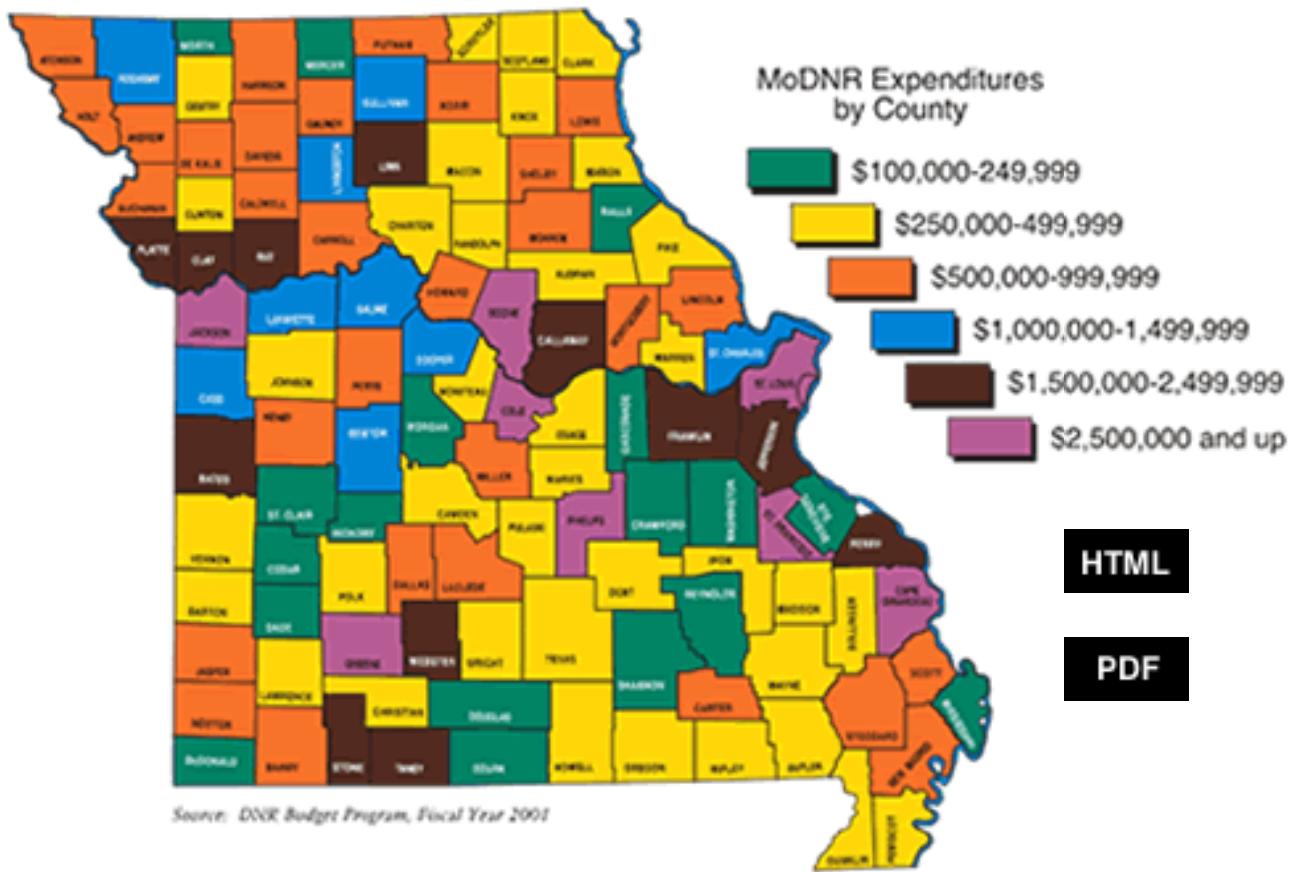
Through several grant programs administered by the department, communities can improve local outdoor recreation opportunities and trails. In many cases, the matching grants are used to install newer and safer playground equipment, improve trails and make parks accessible to persons with disabilities.

A University of Missouri study estimates that the 18 million annual visitors to the state's 83 state parks and historic sites spend approximately \$546 million. The overall economic impact would be even higher.

The [Katy Trail State Park](#) first opened to walking and bicycling traffic in 1990 and expanded to its current 225 miles in 1999. The popular trail which stretches from St. Charles to Clinton has become a main artery pumping lifeblood back into many small railroad communities in a constant search for new economic sustenance. Since 1991, an estimated 300 new trail-related businesses have opened to serve the estimated 300,000 annual visitors to the Katy Trail.

In Hartsburg, located between Jefferson City and Rocheport on the Katy Trail, Karen Rotts found that the wheels of the local economy roll first on the trail. Rotts, owner of Hartsburg Cycle Depot on the Katy Trail, opened her bicycle rental, sales and service shop in 1997 to take advantage of the town's unique position along the trail. "I think the trail's brought a lot of business," Rotts said. "I know next door (at the restaurant) they do a lot of business on days when the trail is busy."

Pass-Through Funding by County



Rotts represents one of several new businesses that have started in Hartsburg to serve trail users. Like many communities, Hartsburg had begun a decades-long economic decline following the cancellation of passenger service along the Missouri-Kansas-Texas Railroad in 1958 and the end of freight service in 1988. In the decade following the conversion of the railroad corridor to a trail, Hartsburg has added two restaurants, a tavern, a bed and breakfast and several antique shops.

Schools, counties and cities seeking ways to save money on energy costs can be helped by the Energy Revolving Fund. The program provides low-interest loans for energy-efficiency improvements, including such projects as insulation upgrades, lighting systems, heating and cooling, and energy-efficient new construction. Since the department's Energy Leveraged Loan Program began in 1989, almost \$38 million in loans have been approved for Missouri schools and local governments. "By leveraging available funds through bond issues, we are able to fund more projects with less money," said EIERA's Massey. These loans continue to save the schools and local governments more than \$7.3 million annually in energy costs.

In some cases, the department works in conjunction with other state agencies to promote projects that enhance economic development. The department's [State Historic Preservation Office](#) works with the Department of Economic Development in administering the state's Historic Preservation Tax Credit Program. The historic

preservation office reviews plans and actual rehabilitation work on historic buildings to make sure the work meets federal guidelines, while economic development administers the state tax credits with combined state and federal tax credits, projects that once were prohibitively expensive now are possible.

The department's [Voluntary Cleanup Program](#) and the Department of Economic Development administer the Missouri Brownfields Redevelopment Program. The program provides an incentive for the redevelopment of environmentally challenged properties known as "brownfields." The cleanup program oversees the site while economic development provides incentives such as remediation tax credits, loans, or grants to pay for all or part of the cleanup.

The department's [Solid Waste Management Program](#) administers the Solid Waste Management Fund, which coordinates technical and financial assistance for solid waste reduction, recycling and resource recovery activities.

From 1991 through 2001, \$26.3 million dollars have been awarded to Missouri's 20 solid waste districts to implement waste reduction and recycling projects and solid waste management activities. These projects have resulted in approximately 539,268 tons of solid waste being diverted from Missouri's landfills. During fiscal years 2001 and 2002, EIERA's Missouri Market Development Program awarded almost \$1 million to 21 Missouri businesses that develop recycled-content products, thus diverting 225,484 tons of waste from Missouri landfills and creating 111 new jobs.



The 2002 Katy Trail Ride, organized by the Division of State Parks, brought over 300 cyclists to Hartsburg. The annual ride follows the entire length of Katy Trail State Park and is a boon to communities like Hartsburg which provide food, lodging and other amenities.

Throughout most of the 1990's, Jefferson City's Governor Hotel sat idle, quickly falling into disrepair as a victim of wind, rain and abandonment. Once the center of Jefferson City's social and political life, the hotel was facing a sure and swift demolition. Through state and federal tax credits, investors were willing to take on the estimated \$15 million rehabilitation cost.

Now, renamed the [Governor Office Building](#), it houses state and private offices and several retail outlets. According to a study by Rutgers University, historic preservation projects like the Governor Office Building rehabilitation annually add an estimated \$1 billion to the state's economy.

The funding opportunities from the department address air, water, land, energy and

several other quality-of-life issues that affect economic development in Missouri. So, while Steve Townley will never have a drive-up window attached to his office, he still approaches his work like a friendly local banker.

For more information on financial assistance opportunities through the Department of Natural Resources, contact the Community Assistance Office at 1-800-361-4827.

Larry Archer is a public information coordinator for the department's Outreach and Assistance Center.



Director's Comment

As December draws to a close, I reflect back on our accomplishments this year. First and foremost, we preserve, protect and enhance Missouri's natural and cultural resources. We work with citizens, landowners, local governments, developers, small businesses and industry as we administer federal and state environmental control and cleanup programs to ensure clean water, air and land.

What often go unnoticed are the economic benefits that clean air, land and water bring to Missouri. Almost 75 percent of Missouri counties receive between \$100,000 and \$1 million in funding from the Department of Natural Resources. Twenty-five percent of Missouri counties receive \$1 million or more in funding from us.

We administer various grant and low-interest loan programs that have awarded more than \$2.5 billion in water and wastewater infrastructure improvements over the past 30 years. Much of this \$2.5 billion was distributed through our State Revolving Funds, one of the largest economic development efforts in Missouri. Because interest rates are much lower than conventional financing, we estimate that the program has saved nearly 300 Missouri communities more than \$350 million. While providing better service to citizens, the communities now have new jobs to offer to pipe layers, heavy equipment operators, construction workers and more. In cooperation with the [Environmental Improvement and Energy Resources Authority](#) (EIERA), the [State Revolving Fund Leveraged Loan Program](#) generates over \$8.50 in construction for every state-match dollar.

During fiscal years 2001 and 2002, [EIERA's Market Development Program](#) awarded almost \$1 million to 21 Missouri businesses. In their development of recycled-content products, these businesses hope to divert 225,484 tons of waste from Missouri landfills and create 111 new jobs.

We also oversee Missouri's 83 state parks and historic sites. According to a study conducted by the University of Missouri, the 18 million state park visitors we see each year spend approximately \$546 million. Over the last



30 years, we have provided almost \$71 million to local parks and trails.

We have provided more than \$176 million in [weatherization assistance](#) funding to citizens. Missouri schools and local governments have taken advantage of almost \$38 million since our Energy Loan Program began in 1989, saving them more than \$7.3 million annually in energy costs.

This year, EIERA issued bonds that will result in more than \$5 million in savings on energy bills for Missouri schools and local governments. Our [Energy Leveraged Loan Program](#) is the first of its kind in the nation.

Our [Community Assistance Office](#) in our [Outreach and Assistance Center](#) makes it easier for citizens, businesses and communities to take advantage of our financial services. Give them a call at 1-800-361-4827 or (573) 526-2415.

Environmental protection can be balanced with economic growth. What's important is that this growth compliments the protection of Missouri's air, land and water resources.

*Steve Mahfood,
Missouri Department of Natural Resource*

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It's Healthy to Retire Your Own Waste Tire Collection



In recent months, public attention has been drawn to the dangers of allowing mosquito breeding sites to remain on private property. West Nile Virus is not the only mosquito-borne illness to threaten human health. Picking up any backyard trash that can collect and hold water improves mosquito control and reduces the chance of contracting encephalitis.

Old tires provide a place for mosquitoes to breed. Steps should be taken to prevent rainwater from collecting in old tires. However, the leading suggestion from the folks at the Department of Natural Resources' Waste Tire Unit is, "Don't collect them in the first place!"

Under Missouri law, once a tire pile exceeds 24 tires, it is eligible for state regulation. It is better to leave them with the tire dealer. There is a fee for tire handling, but by law, no more than \$2 can be charged per new passenger car tire purchased. Larger tires will demand higher fees for handling.

Another option is to cut the tires into three pieces. The cut is made between each sidewall and the tread. This results in three relatively flat pieces that can be disposed of with household trash.

Cutting tires is more work than simply leaving them with the tire dealer. If you have tires to get rid of, you can make arrangements with a tire dealer to accept them. Most have limited storage and would prefer to schedule the delivery.

Missouri's Solid Waste Management Districts and the department's Waste Tire Unit can help property owners find licensed haulers to move their tires to recyclers. Check [www.dnr.state.mo.us/alpd/swmp/swmdinfo.htm]. to obtain information on how to contact your local district, or call the Waste Tire Unit at 1-800-361-4827 or (573) 751-5401.



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Letters

I enjoyed the article by Jane Beetem entitled "[Beyond The Bars.](#)" What's next for the oldest prison west of the Mississippi River?

I have some suggestions I'd like to make for the old prison site in Jefferson City once the new prison is finished. I can foresee a large hotel and conference center that includes apartments for the state representatives to stay in during the time while they are working in Jefferson City.

Jefferson City is a central location so this would be good for a conference center. An entertainment center with restaurants and retail shops could be included. My idea would generate needed revenue for the State of Missouri.

Nancy Wunderlich
St. Louis

I received your [Fall 2002, Vol. 19](#), edition of *Missouri Resources* and saw the picture of [Big Springs.](#) I was born and raised in southeast Missouri (Dunklin County, Glennonville and Wilhelmina). At 17, I left for greener pastures. Army green that is. I worked for the Civil Service over 25 years. Anyway, after looking at the picture on page 15, I was enthralled! When I was about age 13, I went with teenage friends to Big Spring. Unfortunately, I ventured off without my parents' consent. I climbed up the hill (the same hill is visible on the left side of the picture on page 15) with no problems. When trying to get back down, the "springs" startled me and I fell approximately 15 feet straight down. Thankfully, I ended up wrapped around a tree. Most of the flesh between the knee and ankle on my left leg was nearly torn off. I still have the bad scars on my leg today at 62.

Needless to say, I sure caught heck when I got back home. Back then, my

Dad didn't believe in going to doctors for any reason, so we learned to live with our early "mishaps" in life.

Carol C. Martin
Osage Beach

Letters intended for publication should be addressed to "Letters," *Missouri Resources*, P.O. Box 176, Jefferson City, MO 65102-0176 or faxed to (573) 751-6860, attention: "Letters." Please include your name, address and daytime phone number. Space may require us to edit your letter. You also can e-mail *Missouri Resources* staff at moresdnr@mail.dnr.state.mo.us

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News Briefs



State Parks Reservations Made Easier

Beginning in January 2003, campers will have an easier and more convenient way to make campground reservations in Missouri state park campgrounds. The new reservation system will provide several major benefits and is being implemented to increase customer service, according to the Missouri Department of Natural Resources.

Under the new reservation system, more campsites will be available in more state parks - 2,000 campsites in 24 state parks. Making reservations will be easier with phone reservations available from 7 a.m. to 10 p.m. seven days a week and on the Web 24 hours a day seven days a week. Campers will no longer need to call the individual parks but can make reservations at any participating state park by calling 1-877-ICampMO (1-877-422-6766) starting on Jan. 1.

A significant portion of campsites will still be available on a first-come, first-serve basis, except at [Johnson's Shut-Ins State Park](#), which is 100 percent reservable. Unused reservable sites also are available. Campsites in the other 15 state parks and historic site campgrounds also are available first-come, first-serve.

Information about the new centralized system is being made available in the state parks and historic sites. To receive the latest updates on this new customer service, check the state park Web site at [[www.mostateparks.com](#)] or send us your mailing or e-mail address. You can do this by calling the Department of Natural Resources at 1-800-334-6946 (voice) or 1-800-379-2419 (Telecommunications Device for the

Deaf) or e-mail at [moparks@dnr.state.mo.us].



Surfin's Up

The World Wide Web is being woven more and more by Missourians visiting the Department of Natural Resources' Web site [www.dnr.state.mo.us]. From September 2001 to September 2002, the site recorded over 8.2 million page visits, including nearly one million page "hits" per month in June and July of 2002. The Division of State Parks pages receive the most visits by far, with 21 of the top 25 most popular pages on the sites. Other sites visited often include pages on job opportunities, water pollution, historic preservation, solid waste and department news releases. The department's site now includes over 4,500 pages including division and program pages, regulations, events and publications, including current and past editions of [Missouri Resources magazine](#), a popular site for teachers and researchers.



Renewable Energy Conference Set

A state conference in Columbia on March 6, 2003, will highlight Missourians' increased interest in renewable energy - energy sources like wind, biomass and the sun. The conference will include a special focus on bringing citizens, farmers, agricultural and environmental organizations, state legislators and university officials together to discuss the ways renewable energy may benefit the rural economy. The Department of Natural Resources is sponsoring the conference in partnership with the Department of Agriculture and the U.S. Department of Energy.

For more information about the conference, contact the department's [Energy Center](#) toll free at 1-800-361-4827 or (573) 751-3443.



Conference Honors Clean Water Act

October 2002 marked the 30th anniversary of the Clean Water Act - generally considered to be one of the most successful environmental laws in the nation. The date marked a milestone in the effort to protect the country's clean water from discharges from municipal and industrial sources. Streams that were once devoid of water and lakes that were once choked by pollution are vastly improved. Various aquatic populations have been revived. Missouri used the anniversary of the act as an opportunity to educate the public about the importance of our water resources.

In recognition of the act, the Department of Natural Resources, the Metropolitan St. Louis Sewer District and Gov. Bob Holden hosted the Governor's Conference on Clean Water Aug. 26-27 in St. Louis. The conference focused on timely issues related to wastewater management, drinking water quality, security concerns and the use of Missouri's big rivers. Federal and state legislative and regulatory leaders addressed the clean water challenges still ahead. Department staff were on hand to discuss new regulatory directions, financing infrastructure needs and creating wetland protection strategies that would appeal to a wide range of our stakeholders.

OhmMapper — Where Art Thou?

It's in Rolla, at the Missouri Department of Natural Resources' Geological Survey Program. The [Geological Survey and Resources Assessment Division](#) recently purchased an OhmMapper TR1 system with the assistance of federal funds from the Environmental Protection Agency (EPA). This new equipment will help speed up resistivity data gathering in urban settings where asphalt and concrete commonly cover the ground.

"What the technical jargon means," said Glen Young, chief geologist for the Subsurface Investigations Unit, "is that the new equipment helps us

locate ... underground materials. For instance, a steel drum is a good conductor of electricity, so if there is a steel storage tank ... beneath the surface and the ... device (reacts), it may mean that you have located the tank." Young added. Natural and manmade objects below the surface affect how contaminants migrate underground."

The new equipment also is useful in determining how far down bedrock is, and in locating fractures and other features in karst areas. Karst topography is common in Missouri.

The OhmMapper is convenient to use and can be dragged easily across the ground. It is rugged and can be used on any ground surface. Once the field unit has collected the needed information, it can be processed conveniently on a laptop computer right at the investigation site. The new unit replaces a slower system that required longer set-up times and required electrodes to be driven into the ground.



Timber Talk

If a tree is improperly harvested in the woods and someone's around to see it, should they make a noise? The Missouri Forest Products Association (MFPA) thinks so. It has initiated a Forestry Inconsistent Practices Program hotline to take such complaints, according to Cory Ridenhour, MFPA executive director.

The purpose of the hotline - (573) 681-9358 - is to give people the opportunity to report suspected cases of timber harvesting that are not consistent with the association's best management practices. Callers will be sent information on the association's best management practices and a form asking them to describe the violation they saw and its specific location. After a review of the complaint, a forester will contact the landowner or harvester in person. When appropriate, violators could lose their MFPA membership, Sustainable Forestry Initiative certification or logger's certification.

Details of the association's best management practices can be found on

the association's Web site, [www.moforest.org].



Missouri Sends Envirothon Team

"One if by soil, two if by ... water?" Hampshire College, located in colonial Amherst, Massachusetts, was the site of the 15th annual Canon Envirothon July 29-Aug. 4, 2002. The five-member team of Union Star High School recently joined 48 teams, 42 from the U.S. and seven from Canada, to compete in the international event. Union Star (about 20 miles north of St. Joseph), was the 2002 Missouri State High School Envirothon champion.

Hampshire College President Gregory S. Prince, Jr. welcomed the students and officially opened the event. Bob Durand, Secretary of Environmental Affairs for the State of Massachusetts, was the featured speaker and discussed the importance of using the environment as an integrated context for learning. More than 250 students competed in the weeklong event.

Union Star High School team members Aaron White, Andrew Lewis, Matt Daniel, Jacob Carlson and Jeff Evans participated in hands-on study and research about soils, forestry, aquatics, wildlife and the 2002 topic - invasive species. Their coach is Brad Johnson.

"The Canon Envirothon encourages students to learn more about their local, state, provincial, national, and global environments," said Clay Burns, executive director of the Canon Envirothon. "Our mission is to develop knowledgeable, skilled and dedicated citizens who are willing to work to achieve and maintain a natural balance between the quality of life and of the environment. The competition helps prepare high school students to become tomorrow's natural resource managers."

Missouri will host this event in 2005 on the Southwest Missouri State University campus in Springfield. For more information about the Missouri Envirothon, contact Peggy Lemons at (573) 761-3105, ext. 3 or Judy Stinson at (573) 751-4932.



Repairs Close Visitor Center

The visitor center at [Route 66 State Park](#) near Eureka has been closed temporarily so major renovations can be made. The project will include creating the center's orientation room, and enlarging the center's exhibit space and gift shop. An elevator will be installed to provide easier access to the second and third floors and the public restrooms will be renovated so they are accessible to people with disabilities. The mechanical and electrical systems also will be redone.

Although the visitor center will be closed, the rest of the park, including the trails and day-use area, remain open to the public. The visitor center is expected to reopen in May 2003.

This is the first phase of work on the visitor center, which was built in 1935 and served as a roadhouse along Route 66 for many years. The 409-acre Route 66 State Park showcases the history of the highway that has been called "The Main Street of America." A portion of the original Route 66, including a historic bridge across the Meramec River, runs through the park. Other projects under way this winter include a new open picnic shelter and a boat ramp accessing the Meramec River.

Earth Science Week Recognized

Each year the American Geological Institute recognizes one week in October as Earth Science Week. State geological surveys across the United States participate in the celebration including the Missouri Department of Natural Resources' [Geological Survey and Resource Assessment Division](#). On Oct. 4, Gov. Bob Holden signed a proclamation designating the third week of October as Earth Science Week for Missouri.

The purpose of Earth Science Week is to acknowledge the important role that earth sciences play in our everyday lives. This year there was specific emphasis on how earth science information assists scientists in

protecting our water resources. The disciplines of geology, hydrology, land surveying and engineering play fundamental roles in protecting the quality and quantity of our water resources.

Staff from the department's Geological Survey and Resource Assessment Division in Rolla and Jefferson City make special efforts during Earth Science Week to take the message to Missouri students. "Our children will be making important environmental decisions in the near future," said Mimi Garstang, State Geologist and director of the division. "The more they understand about the earth sciences, the better they will be equipped to make those decisions."

Adopt-the-Shoreline Reaches "Miles-stone"

Member organizations participating in the Lake of the Ozarks Adopt-the-Shoreline program held a celebration for exceeding 500 miles of shoreline "adopted" for litter control on Sept. 26, 2002.

The event was held at AmerenUE's scenic overlook on Upper Power Plant Road above Bagnell Dam.

Adopt-the-Shoreline is a volunteer program to remove unsightly trash and debris from the shoreline of Missouri's Lake of the Ozarks. Participating groups and individuals "adopt" at least five miles of shoreline and take part in the Annual Shoreline Beautification Cleanup each spring. Many participants also conduct a fall cleanup. Begun in 1994 with nine civic groups adopting 89 miles of shoreline, participation has grown to 74 groups and more than 518 miles of adopted shoreline. This amounts to 45 percent of the lake's total 1,150 miles of shoreline. Adopt-the-Shoreline is sponsored by AmerenUE, which handles administrative and disposal costs, but cleanups are conducted entirely by volunteers.

Program Coordinator Colleen Jarvis invites organizations interested in joining Adopt-the-Shoreline, or persons wishing to help with the spring 2003 cleanup to call (573)-365-9310.



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One Last Word

Icy Anniversary

by Karl Fett

In late January 2002, an ice storm struck northwest Missouri, including the Kansas City area. It caused many tree branches to break. Electric power outages were widespread and some homes and businesses were without power for up to two weeks. During that time, the department assisted some communities whose drinking water supplies were jeopardized by the blackouts.

Most water suppliers that lost power temporarily used water in storage while equipment was powered by emergency generators.

In the aftermath of the storm, individuals, cities, counties, state agencies and private land owners were faced with a tremendous volume of wood waste or fallen trees and broken branches that needed to be disposed of or put to beneficial use. Huge volumes of brush were collected and mulched near Arrowhead stadium and other locations. Numerous inquiries beckoned the Missouri Department of Natural Resources to create guideline documents for individual property owners and municipalities. The department reacted with flexibility and speed so cities and property owners could quickly respond to this incredible natural disaster.

Wood waste can be used for firewood, commercially recycled or converted into brush piles for wildlife. It also can be mulched for landscaping and walking trails, used for erosion control or added to gardens or farmland as a soil amendment. The department provides guidance for large-scale

agricultural application.

Municipalities and cities also burn wood waste or place it in landfills. During this crisis, the yard waste material ban for landfills was temporarily waived for several months so landfill operators could accept storm debris. In late winter 2002 and early spring, the department's Kansas City Regional Office alone issued nearly 70 permits for cities and more than 350 permits to individuals to burn brush, almost four times the norm. Many of the large municipal operations used air curtain destructors which nearly eliminated smoke emissions.



Victoria Kiefer, an environmental specialist with the Department of Natural Resources' Kansas City Regional Office, took this photo following one of the worst ice storms in Kansas City history. The three-day storm started on Jan. 29, 2002 and left an estimated 350,000 customers without electricity. Photograph by Victoria Kiefer

The ice storm of last winter was unusual in terms of its severity and widespread damage. Still, it is comforting to know that when necessary, state agencies, local governments and individuals can move cooperatively, efficiently and quickly to achieve results for the good of all.

Karl Fett is an environmental manager in the department's Kansas City Regional Office in Lee's Summit.

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Resource Honor Roll



Scott Totten, Jennifer Smith and her FFA advisor, Larry Henneke

2002 Winners State FFA Awards

The 74th annual State Convention of the Missouri FFA Association was held at the Hearnes Center in Columbia on April 18 and 19, 2002. The hard work and achievements of many young people who represented our agricultural future were rewarded.

FFA students from around the state were chosen as one of the 12 area winners eligible for the Environmental Science and Natural

Resource Management Proficiency Award. Agriculture proficiency awards are available to all FFA members enrolled in high school agriculture, including special needs students. Scott Totten, Water Protection and Soil Conservation Division director, presented the award, sponsored by the Department of Natural Resources.

The award area of Environmental Science and Natural Resources Management recognizes the students who have received practical experience in the principles and practices of managing and improving the environment and natural resources. Activities include management of agricultural waste, recycling of agricultural products, environmental cleanups, conservation corps, agricultural energy use, multiple uses of resources, land use regulations including soil, water and air quality, wetland preservation, grasslands, wildlife surveys, erosion and pollution prevention and public relations.

The 12 area winners were Chris Burk, Richmond; Nathan Scott, Chillicothe; Janet Ratliff, South Shelby; Jennifer Smith, Columbia; Travis Fricke, Higginsville; Tony Haile, California; Charlie Tullis, Carthage; Justin Wayne Lemmon, Bolivar; Kody Hedrick, Marionville; Wyatt Wade, Licking; Jordan N. Naeger, Ste. Genevieve; and Keith O'Neill,

Doniphan.

The first place winner was Jennifer Smith, a member of the Columbia FFA Chapter. Her parents are Michael and Stephanie Smith. Her advisor is Larry Henneke. Smith was one of 49 individuals chosen as a State Agricultural Proficiency Award winner. She serves as a positive role model for other students pursuing a career in agriculture, food and natural resources. As a FFA member, Smith's supervised agricultural experience (SAE) included: setting and controlling burns, trapping nuisance animals, seeding pastures, fencing off creeks, and cross-fencing to establish rotational grazing. Smith has been very active in her FFA chapter by attending both the state and national FFA conventions. She also has been on several contest teams at the state level. Outside of FFA, her activities include National Honor Society, Fellowship of Christian Athletes, French Honor Society, and interning at the University of Missouri-Columbia's College of Veterinary Medicine.

Each state winner receives a framed certificate, \$100 cash and a chance to advance to the national competition.

The Missouri FFA Association has 20,588 student members preparing for leadership and careers in the science, business and technology of agriculture through 287 local chapters. FFA develops student potential for leadership, growth and career success.

William and Carol Norton Historic Gift Preserved



Bill and Carol Norton

Meriwether Lewis and William Clark never suspected that one hundred and ninety-eight years after they explored it, one of their documented visits would become a historic site in a state named Missouri. Thanks to the generosity of Bill and Carol Norton of Jefferson City, a now-famous bluff near the confluence of the Missouri and Osage rivers in Cole County will be known as the Clark's Hill/Norton State Historic Site. The 13-acre acquisition was official on June 1, 2002, 198 years after Clark visited the site. "This donation by the Nortons will give the Missouri state park system an important

site in the department's efforts to interpret the Lewis and Clark Expedition during its 200th anniversary and beyond," said Stephen Mahfood, director of the Missouri Department of Natural Resources. "We are pleased that the Nortons have helped us ... make it available to the public."

The Lewis and Clark Expedition arrived in the area on June 1, 1804. Clark's journal noted that he ascended a hill with a rock under it that was more than 100 feet high and afforded a "delightful prospect" of both rivers.

Donating the area for the benefit of all Missourians was not as easy of a decision as it might seem. With the increased publicity and anticipated influx of visitors, adequate protection of the site was imperative to the Nortons. "We have a huge amount of respect for this site's historical significance and have protected it quietly for years," said Carol Norton. "We realized that now is another time of historical significance. We are pleased to be able to share this remarkable area with others who will also value and protect it."

The property has been with the Norton family for 28 years, and the Nortons, along with their three children, wanted to be active participants in the planning of the future access, layout and use of the site. "The people from DNR walked the ground with me several times to lay out the trail and to determine what will be at the overlook," said Bill Norton. "We are still talking about how we can get this done in time for the (Lewis and Clark) Bicentennial," he added. Both Bill's and Carol's (Albrecht) families are fifth-generation Missourians. One of Bill's ancestors was called to defend the bridge at Lexington, Mass. This bolsters their interest in preserving the nation's, as well as Missouri's, heritage for future generations.

Once developed, visitors will be able to stand where Clark actually stood - and see for miles in all directions. Plans for the site include a parking area, trail and overlook with interpretive information. The department has received preliminary approval from the National Park Service for a \$50,000 Lewis and Clark National Historic Trail 2002 Challenge Cost Share Grant to assist with development.

With the acquisition of Clark's Hill/Norton State Historic Site, Missouri now has 83 state parks and historic sites.

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river RELIEF '02

photographs by Scott Myers

Thanks to nearly 900 volunteers, the Big Muddy is still muddy, but much less trashy.

Missouri River Relief 2002, organized by Missouri River Relief and Illinois-based Living Lands and Waters, pulled tons of trash from the river during fall events in Hartsburg and St. Charles. While many volunteers were running the boats and working the riverbanks, others, coordinated by the Department of Natural Resources, cleaned up sections of the department's Katy Trail State Park in those same areas.

Chad Pregracke, whose Living Lands and Waters provides the cleanup barge, said he looks forward to coming to Missouri. The volunteer, state and corporate support of the Missouri River cleanups surpasses that of similar cleanups on the Mississippi and other rivers. Included in that support was a new 18-ft. utility boat donated to Missouri River Relief by Bass Pro Shops, a corporate sponsor. Pregracke accepted the boat on behalf of the effort at the St. Charles event.

"You don't get this sort of help in other places and other states," Pregracke said. "I forgot how great it was until I got back here."



Dick Turner of the Missouri Department of Conservation uses a stream table to teach New City School students from St. Louis about stream hydrology. Turner was one of many environmental educators at the pre-clean up workshops. DNR photo by Scott Meyers

Workshop for Students, Teachers

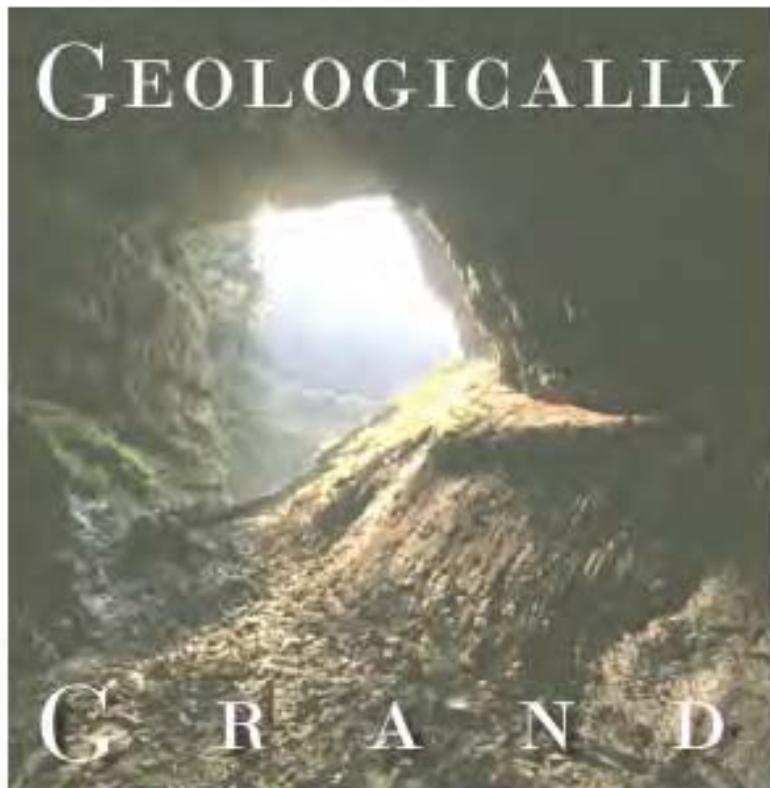
This year, the Missouri River Cleanup events offered an excellent opportunity for teachers and students. Missouri Department of Natural Resources Environmental Education Specialist Bryan Hopkins developed an educational component that featured a teacher packet containing activities for building a simple model watershed, as well as documentation of the natural history of the Missouri River from the perspective of Lewis and Clark. An educational forum was

offered the day before the river cleanups in both central Missouri and St. Charles, and served as an organized field trip experience. Over 400 students from 11 schools learned about the cleanup site, the trash barge and related equipment as well as participated in a wide variety of educational presentations and activities provided by various agencies and educational groups.

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Resources to Explore



The Peculiar Geology of Grand Gulf State Park

by Cheryl Seeger

photographs by Scott Myers

"... (We) started up the nearly perpendicular wall ... by a sort of 'blind trail' that would have caused a mountain sheep to sigh for wings, but it was very beautiful."

said geologist Luella Owen in 1898. Fifty-eight years later, geologist J. Harlen Bretz noted, "This collapse chasm is without equal in the state."

Long known to local residents as "Missouri's Little Grand Canyon," Grand Gulf became [Grand Gulf State Park](#) in 1984, a National Natural Landmark in 1971, and a Natural Area in

1986. The property, located 6 miles west of Thayer in Oregon County, is privately owned by the L-A-D (Leo A. Drey) Foundation and is leased to the Missouri Department of Natural Resources.

At nearly one mile long and 50 to 200 feet wide, Grand Gulf is one of Missouri's largest collapsed cave systems. Only a few tens of feet deep in its upper reaches, it quickly drops to over 120 feet in depth. The chasm's two branches wind between near vertical to overhanging cliffs and converge just west of a natural bridge. "Narrows" in the chasm reflect the original cave architecture.



The natural history of Grand Gulf is a tale of ancient seas, earthquakes, stream piracy and tornadoes. Its story began nearly 480 million years ago during the Ordovician time period, when a shallow ocean covered Missouri. Sediments composed of marine animal shell fragments, algae and mud accumulated on the ocean floor and, over time, hardened into limestone that later became dolomite.



(Title photo) Grand Gulf State Park features a dramatic natural bridge, one of the largest in Missouri. (Above) The geology of the park is dominated by a deep chasm formed by a collapsed cave.

Eons passed, the ocean retreated and overlying rocks eroded, exposing the dolomite at the ground surface. Around 1 to 2 million years ago, an earthquake on Grand Gulf Fault broke the rock, laying the groundwork for karst development.

Karst, named for a region in Italy and Slovenia, includes a family of features formed by dissolution of bedrock. Rainwater, mixed with carbon dioxide from decaying vegetation, becomes weak carbonic acid. As the water trickles underground, it follows fractures in the rock, dissolves limestone and dolomite and ultimately forms caves, sinkholes, springs and losing streams.

If it were not for the next chapter in the story, however, Grand Gulf would simply be another cave in a state renowned for numerous caves.

Grand Gulf is a "collapse cavern," formed when a cave roof collapses. At Grand Gulf, a large section of the cave's roof collapsed as recently (geologically speaking) as 1,000 to 10,000 years ago. The collapse probably began as a small sinkhole in the furthest western extent of the former cave. The cave roof, weakened by the fault, collapsed progressively eastward and produced a chasm of "grand" proportions. Part of the cave roof escaped collapse, forming one of the largest natural bridge

formations in Missouri.

Boulder piles visible within Grand Gulf Sink (east of the natural bridge), and in the main chasm are cave roof remnants. With estimates of the original cave roof thickness at around 100 feet, the original cave must have been much deeper to hold all the broken roof material and remain the chasm seen today.

Grand Gulf also is stellar example of subterranean stream piracy. Bussell Branch, a surface stream, originally crossed the surface over the cave and emptied into English Creek about a mile away. When the cave roof collapsed, Bussell Branch was "pirated" by the chasm. The stream now winds down the western arm of Grand Gulf, threads under the natural bridge, briefly reappears in the sink, and disappears into Grand Gulf Cave.

The entrance to Grand Gulf Cave is visible at the northeast edge of the sink. Exploration has been limited to a short distance since 1921, when tornado debris plugged the passageway. Early explorers encountered a subterranean river, navigable by small boat. Luella Owen, who visited in the 1880s, was one of the explorers on this river. "Although the water looked perfectly placid, the boat drifted with surprising (sp) speed, so that the two scared faces peering after me were soon lost sight of ... , " she reported. Owen was enchanted by the small eyeless cavefish "swimming about the boat in an astonishing multitude." After a time, Owen turned back at the request of her fellow explorers, but left us with an eloquent description of her visit.

Just how far Owen penetrated into the cave is unknown. The full length has never been explored, but we do know the underground river surfaces eight miles away at Mammoth Springs, Ark. Early attempts to prove this included tossing a bale of oats into Grand Gulf Sink during heavy rains and noting their appearance at the springs over the next several days. Dye tracing in 1967 by Tony Aid, a West Plains high school student, provided conclusive proof of the underground connection between Mammoth and Grand Gulf.

A visit on a hot, muggy Missouri summer afternoon, with verdant trumpet vines and wild grape festooning the chasm walls brings to mind adventurers crossing uncharted territories. Winter and early spring, however, when vegetation is minimal, are the best times to experience Grand Gulf's true scale and grandeur.

Editor's Note:
This is the final installment of a four-part series recognizing the 25th anniversary of the Missouri Natural Areas Program. The Missouri Natural Areas Program is a cooperative effort by state and federal agencies, conservation organizations, local governments, corporations and private citizens to protect some of the state's best examples of natural communities.

The program is jointly administered by the Missouri Department of Natural Resources and the Missouri Department of Conservation with representation by the U.S. Forest Service and the National Park Service.

For those less adventurous than Luella Owen, several trails provide insight into Grand Gulf. A short loop near the parking area provides views of the cave entrance and deepest parts of the chasm, as well as passage across the natural bridge. A boardwalk takes visitors down into the chasm's southern arm, where a wet-weather spring and waterfall reward the viewer. A longer path parallels the chasm's longest arm, winding through woodlands dominated by oaks, wild cherry and dogwood.



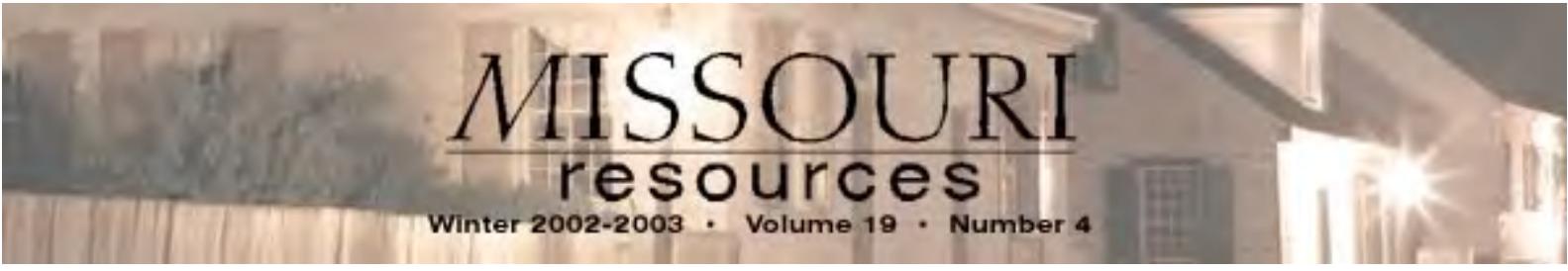
Stairs cling to the side of the canyon wall and give access to the bottom of the gulf.

Visitors after heavy rainfalls, when plants and other debris temporarily plug the cave, may see a lake in the chasm. The lake, which sometimes reaches over 75 feet in depth and submerges the cave entrance, generally drains over the course of a few weeks.

One of the missions of the Missouri Natural Areas Program is to recognize geologic features of outstanding and unique quality. Some geologic features are included in natural areas primarily noted for their biological communities; others are so unique they stand on their own. Grand Gulf State Park fulfills this latter criterion with ease. If visiting Grand Gulf whets your appetite, other state park's with geological natural areas include [Elephant Rocks](#), [Hawn](#), [Taum Sauk Mountain](#), [Ha Ha Tonka](#) and [Johnson's Shut-Ins](#).

Cheryl Seeger is a geologist with the department's Geological Survey and Resource Assessment Division.

Today, the Missouri Natural Areas Program includes 178 natural areas totaling 56,861 acres. Thirty-nine areas totaling 16,600 acres are located in Missouri state parks.



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MISSOURI'S SOIL SURVEY 100 YEARS IN THE MAKING

Do you have a building project planned for the near future? A new house, pond, deck or fence? Or, are you planning on buying some land? Before you build or buy, wouldn't it be great to know about potential problems you may face on your land? Does it flood? Are you going to hit bedrock at three feet and have to blast out a basement? Is your basement or sidewalk going to crack? Will your pond hold water? Is your property subject to soil erosion?

What if there was a source of information that could tell you about the land you were going to develop? The Missouri Soil Survey is just that. Each county has its own specific survey which can be found at the county Soil and Water Conservation District office. District staff can help you locate your property on the map and explain the differences in the soils on your land. The soil survey is a general tool, and can explain the trends in your area. With some information about your property, you can develop your land with its individual soil and water limitations in mind. A little foresight may prevent costly repairs later.

The History Of The Soil Survey

In 1894, the federal government established the Division of Soils with Milton Whitney as chief. This division, placed under the U.S. Weather Bureau, studied the relationship between climate and vegetation.

The soil survey began in 1899 as a way to increase agricultural



Field soil scientists used bucket augers to examine the soil. NRCS file photo

prove that statement wrong.

Missouri published its first survey for Howell County in 1902. College students conducted early surveys with hand tools, usually during the summer months. By 1920, 52 counties in Missouri had published soil surveys. Polk County published its version in 1926 - the last county to publish a survey for 19 years.

The Great Depression

The stock market crash of 1929 and the drought in the Great Plains combined to plunge the nation into the worst economic conditions in its young history. Poor land management, including slash and burn agriculture, overgrazing, plowing of native prairie grasses and the establish-

ment of dry wheat and grain crops, teamed up with years of drought and killed most of the vegetation in Oklahoma, Kansas and parts of other plains states. Fierce winds blew the soil off the land and hundred of miles east. In 1934, the first dust storm blew across the U.S. from the plains to the eastern seaboard. The sky turned yellow, then black as 300 million tons of soil was permanently blown from the plains of the Southwest.

Hugh Bennett, director of the Soil Erosion Service, was not one to miss an opportunity. In March 1935, aids informed Bennett another dust storm was making its way toward Washington. Bennett wanted Congress to understand the erosion problems the country faced, and establish a permanent soil conservation agency. Bennett timed his speech to coincide with the arrival of the dust storm. As the sky darkened over Washington for the second time in one year, Bennett preached: "... Americans have been the greatest destroyers of land of any race or people, barbaric or civilized." He stated the demand for "... a tremendous national awakening to the need

land development. Areas in the eastern United States were examined for tobacco crop potential. The dry climate of the West was surveyed to determine if agriculture was even possible.

At that time, it was believed that the soil was limitless. The United States Department of Agriculture (USDA) even issued a bulletin in 1909 stating: "The soil is the one indestructible, immutable asset that the Nation possesses. It is the one resource that cannot be exhausted; that cannot be used up." It took less than 30 years to

for action in bettering our agricultural practices." The Soil Conservation Act passed and the Soil Conservation Service (SCS) was born.

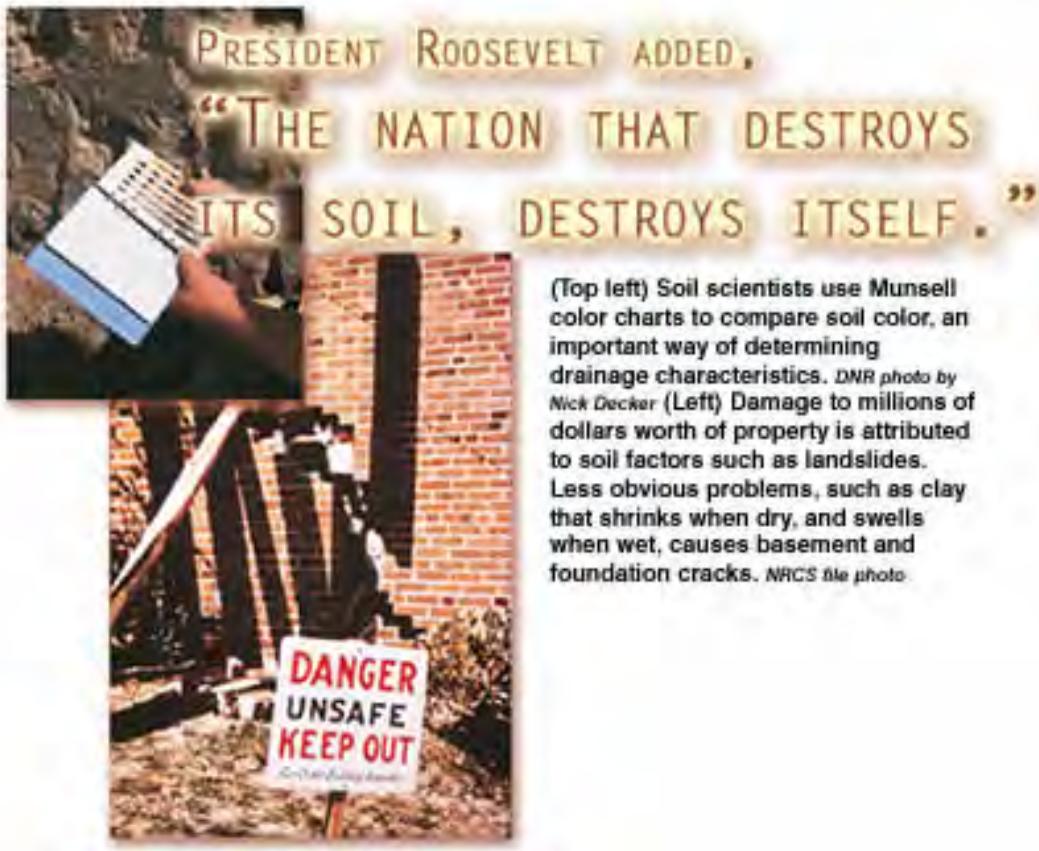
During the depression, the soil survey seemed to lose its focus. The SCS was put in charge of the Civilian Conservation Corps (CCC) involving a massive workforce to build terraces and other demonstrations on agricultural lands in order to get the nation working again. Forty-one camps operated in Missouri, employing over 100,000 men. They built lookout towers, roads, terraces, and park shelter houses. Highly specialized studies, such as the soil survey, were put on the back burner. However, work was being done throughout the 1930s. In 1942, the CCC was disbanded. Soil survey work began again and Linn County's survey printed in 1942.

Part of Hugh Bennett's plan was to promote local interest and input in soil conservation. To achieve this, Bennett pushed for soil districts in each state. Each district board, made up of elected local landowners and farmers, determines the issues and concerns for their county, while the SCS provides technical assistance. In 1943, Missouri passed a law to form Soil Conservation Districts. During 1944, 14 counties formed districts. Unfortunately, the newly formed districts, with technical assistance from the SCS, ignored the scientific data and input from the University of Missouri. The university had built its reputation on the science collected and set up roadblocks to prevent more districts from forming. Eventually, the relationship was smoothed out, and now all counties have a Soil and Water Conservation District, and University Extension agent.

In 1951, the SCS developed the Land Capability System. By using factors such as flooding frequency, slope, rockiness and clay or sand content, the best use for the soil can be estimated. For example, a soil that holds water like a sponge is great for building ponds, but unsuitable for your basement. Clay that shrinks when dry but expands when wet can cause basements and foundations to crack.

NRI Inventory

It was not until the 1977 National Resource Inventory (NRI) that the Missouri Soil Survey became a priority again for the SCS. The NRI monitors changes in land use and is updated every five years. The NRI showed Missouri had lost



(Top left) Soil scientists use Munsell color charts to compare soil color, an important way of determining drainage characteristics. DNR photo by Nick Decker (Left) Damage to millions of dollars worth of property is attributed to soil factors such as landslides. Less obvious problems, such as clay that shrinks when dry, and swells when wet, causes basement and foundation cracks. NRCS file photo.

half of its topsoil since it was settled.

For overall erosion, Missouri was the second-worst state in the nation, behind Tennessee. On average, it was estimated 10 tons per acre each year was lost. It soon became obvious that if Missouri wanted to retain its valuable soil resources, more time and money had to be directed to that effort. The Soil and Water

Conservation Districts began a successful grassroots effort that passed the one-tenth-of-one-percent parks and soils sales tax. Missouri went from a state with one of the lowest soil conservation budgets to the largest soil budget in three years time. That money funded a joint effort between soil scientists in the Department of Natural Resources and SCS (renamed Natural Resource Conservation Service - NRCS - in 1994), with the help of the University Soil Characterization survey. Since 1970, more than 82 county soil surveys have been completed or updated.

The 1985 Farm Bill provided incentives to farmers to put soil-conservation practices to work. Highly erodible lands as well as wetlands were removed from agricultural production. Through the parks and soils sales tax, opportunities are available to landowners for technical and financial assistance for applied soil conservation practices.

The Last Acre Ceremony, celebrating the completion of the Soil Survey, was held in Jefferson City, on the lawn of the Governor's mansion on April 19, 2002 - one hundred years after the first survey was published. All of Missouri's 114 counties have been mapped, with more than 5,000 soil types mapped on 44.6 million acres. In some ways, not a lot has changed since the survey's beginnings in 1899. The men and women that collect the information still walk the landscape using hand tools such as augers and probes to determine soil type. However, aerial photography, topographic maps, truck-mounted augers and Global Positioning Systems make the job easier. Mapping now is copied onto ArcView, a mapping system, rather than hand copied onto field sheets. Now, the survey is digitized and copied on CD-ROM as well as published in book format.

Throughout U.S. history, our prosperity has mirrored our use of the soil. During the 1930s, the country was suffering dire economic times and losing its soil to wind erosion by the ton.

Today, modern farming practices allow fewer farmers to produce enough food for all. This frees others to move away from the land and work in different industries. As our population grows, prime farmland as well as marginal land is developed. It is important for homeowners, developers and landowners to understand the limitations of their soil to prevent costly mistakes and ensure structures are built on solid ground. President Roosevelt stated, "The nation that destroys its soil, destroys itself."

Missouri Soil Surveys can be obtained through your local Soil and Water Conservation District Office, NRCS office or on the Web at [www.mo.nrcs.usda.gov/technical/section2/cntytoc.html].

Georganne Bowman is a former soil scientist with the department and currently works as an environmental specialist with the agency's Water Pollution Control Program. Bill Pauls, a soil scientist with the U.S. Department of Agriculture's Natural Resource Conservation Service, provided background for this story.



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Suitcases Packed With Memories

by Jennifer Sieg

photographs by Scott Myers

Enthusiastic chatter fills the living room as a pile of clothes, shampoo, insect spray and other items accumulate in a sloppy pile in the middle of the floor. Most of the sentences begin with, "Remember last year when" and end with, "... that was so cool." This kind of chatter fills the air in homes throughout the state as kids pack their suitcases, feverishly anticipating the days or weeks of camp that lie ahead.

Where are all of these kids going? Organized youth groups around the state host their camps at group camping facilities housed in Missouri's state parks. The Missouri Department of Natural Resources' Division of State Parks owns and operates 13 group camps in seven different state parks. They are located within [Crowder State Park](#) near Trenton, [Mark Twain State Park](#) near Stoutsburg, [Cuivre River State Park](#) near Troy, [Dr. Edmund A. Babler Memorial State Park](#) in Wildwood, [Roaring River State Park](#) near Cassville, [Lake of the Ozarks State Park](#) in Kaiser and [Knob Noster State Park](#) in Knob Noster. The camps house between 44 and 200 campers.

Facilities at each camp include a dining hall with kitchen, sleeping cabins or barracks, modern restrooms and showers, and various outdoor recreation opportunities. Some camps have recreation buildings, craft houses, play courts, hiking trails and facilities for swimming and boating. Along with the camping facilities, the state park system offers groups the option of using other park amenities such as park naturalists for interpretive programs, nature centers and even horseback-riding stables where available.

"The state park system's group camps are reasonably priced and offer the perfect setting for the outdoor experience that most youth groups are seeking," said Douglas Eiken, director of the department's Division of State Parks.



Girl Scouts enjoy Camp Colburn at Mark Twain State Park.

Every year, kids from all over Missouri swarm to these camps throughout the summer. Girl Scouts, Boy Scouts, 4-H groups, church groups and various other youth organizations haul kids to camp by the busloads. Organizers plan activities such as scavenger hunts, nature hikes, craft activities, adventure courses, campfire sing-alongs and other cool group activities that will create memories that last a lifetime.

Making new friends, getting away from parents, swimming, dances, no chores, staying up late and having fun topped the list of what campers liked most about camp. The answer shouted by boys most often was, "the girls!" The girls at 4-H camp at Camp Clover Point in Lake of the Ozarks State Park, however, were a little more specific as they replied, "the lifeguard!" "I like everything about camp because it gets me away from my regular life," said Jamie Herndon, a 4-H camper from Versailles.

The kids are not the only ones that enjoy the group camp experience. State Auditor Claire

McCaskill has attended a Girl Scout "Mom and Me" camp for the last three years with her daughter, Lily. "I look forward to it all year," said McCaskill.

"I believe that group camps are a good, safe way for kids to learn to be away from home," said Eleanor Kloeppe, organizer of the 4-H camp through the University of Missouri Extension Center for several mid-Missouri counties. "Kids form really good friendships from outside of their school groups and home towns. It's a good experience because they learn that they can manage without air conditioning and their video games and other gadgets. Over the years, it has become more of a challenge to keep them occupied, though, because they are used to being entertained."

Connie Argetsingor, who organizes group camps for the Becky Thatcher Area Girl Scout council held at Camp Colburn at Mark Twain State Park, said, "The girls and adults don't like to set up tents anymore, but like to do the outdoor activities. The group camp makes the camping experience a lot less work, therefore, making it available to a lot more girls. The older girls really appreciate the hot showers and electricity and really have a blast at camp." Argetsingor says that many of their activities are guided by requirements for various patches earned through the Girl Scout program.

For nearly 20 years, the Christian Church in Mid-America, Northwest Area, has used Camp Grand River at Crowder State Park. The camp is centrally located to the 30 to

40 churches in their area that send kindergarten through high school age children to the camp.

"The facilities are very reasonably priced and are well taken care of. I'm just thrilled to see taxes do something great," says Donna Rose-Heim, camp coordinator. As a community service project, her church group has donated and installed fans and an ice machine in the facility's dining hall.

Debbie King, health care services coordinator for the Muscular Dystrophy Association, Inc. (MDA) in the St. Louis area, says that their group is "fiercely loyal" to the Jacob L. Babler Outdoor Education Center inside Dr. Edmund A. Babler Memorial State Park. The camp was built in 1976 specifically to accommodate people with disabilities. Prior to 1976, the group used a camp near the Lake of the Ozarks.

"This kind of facility is so important to groups like ours," said King. The spacious cabins, paved pathways, large recreation hall and accessible swimming pool make the camp easy to use and enjoy for campers and volunteers. The 2002 theme for the MDA camp was "MDA Magical Tour," which led campers on an exciting tour of various areas of the United States, with each day having a different theme. With activities including horseback riding, swimming, scuba diving, arts and crafts, wheelchair hockey, dances and an Elvis impersonator contest, each participant left camp at the end of the week with "miles of memories" to savor.



After a late morning break, 4-H campers head to another activity at Camp Clover Point in Lake of the Ozarks State Park.

Camp coordinators have to pull together a lot of people resources to ensure that the week runs smoothly for all involved. Most groups hire staff to do such tasks as the cooking, nursing and lifeguarding, while others rely on volunteers. Counselors also vary between groups, with some being college students and adult volunteers taking off work to help out and others being older, teenage members of their organization. "I enjoy planning the camp activities every year and like working with the kids, teaching them new songs and games," said Christa Herigon, a 4-H camp counselor.

Group camps have been a part of the state park system as long as the parks themselves. The Civilian Conservation Corps (CCC), a large workforce organized by

President Franklin Roosevelt to help create jobs during the Great Depression in the 1930s, built most of the state park system's group camping facilities in the parks as they developed the rest of the park. Group camping facilities in Lake of the Ozarks, Cuivre River and Knob Noster state parks were built by the CCC while these areas were operated by the National Park Service as federal recreation demonstration areas, prior to becoming state parks. The National Park Service built them with the idea of getting kids out of the congested cities and into these parks so they could breath fresh air, enjoy nature and the great outdoors.

Mary Edwards attended Girl Scout camp at the Lake of the Ozarks in the early 1940s. She recalls taking boat trips on the lake, swimming and doing a variety of outdoor activities still enjoyed by campers 60 years later she says, however, she "will never forget the cold showers."

Throughout the many years that the group camps have been in operation, the Department of Natural Resources has made numerous improvements, including hot showers. Funding for such improvements comes from the one-tenth-of one-percent parks-and-soils sales tax approved by Missouri voters. Several of the camps' cabins have been rebuilt to include restrooms in the cabins, rather than a community restroom. Sidewalks have been installed and swimming areas built, yet rates stay reasonable. Instead of contracting work out to private companies, the department uses its own work force to make improvements to the camps. When rebuilding cabins in some of the camps in the 1970s and 1980s, the nails and some lumber were reused to keep costs at a minimum. The camps are kept simple and rustic, yet provide enough modern conveniences, like hot showers, modern kitchen equipment and electricity, to make the camping experience easier for all participants.

Some of the group camps, however, still remain as the CCC built them in the 1930s. Becky Martin, whose husband's family reunion has been held the last seven years at group camps at Lake of the Ozarks State Park, fell in love with the setting at Camp Pin Oak, which is one of the camps that has not been rebuilt. "We visited some friends who were at one of the group camps with a church group and fell in love with the fireplaces and rustic setting, so we started using it for the family reunions. Although Camp Pin Oak is my favorite, we've moved our reunions to Camp Clover Point because the paved pathways and restrooms in the cabins make the experience easier for the older family members."

On dates that youth groups are not using them, the group camps are made available for use by adult groups, clubs and families. Many families, like the Martins, use the



Kids venture onto Lake of the Ozarks in canoes at 4-H camp. Canoeing is one of the most popular activities at Camp Clover Point. For many, youth camp provides their first experience in a canoe.

facilities for family reunions. "All we have to bring in is the food - no plates or cups. We stay in the different cabins as a family and everybody can afford it," said Martin.

As the summer winds down, kids are arriving home from camp ready for a three-hour nap. As parents unpack the dirty, wet clothes, which are now shoved in wads inside the suitcase, unfamiliar phone numbers scribbled on

napkins and the tube of toothpaste that looks like it never got unpacked, they should remember that the most important things are packed inside the kids themselves - lasting friendships and unforgettable memories.

All of the state park system's group camps are available from April 15 to Oct. 15. Applications are accepted up to 11 months in advance of the requested arrival date and must be submitted to the respective park office not later than Oct. 16. Rental priority is given to nonprofit, youth organizations, except at the Jacob L. Babler Outdoor Education Center where priority is given to groups of people with disabilities.

For more information, contact the [Missouri Department of Natural Resources](#) toll free at 1-800-334-6946 (voice) or 1-800-379-2419 (Telecommunications Device for the Deaf) or visit the Web at [www.mostateparks.com].

Jennifer Sieg is a public information specialist with the Department of Natural Resources' Division of State Parks.

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Near the turn of the 20th century, the market for electric power generation in St. Louis was active and full of competitors, including the Laclede Power Company of St. Louis, founded in 1891. The company acquired a permit to build its power plant at 1240 Lewis Street (right) in 1901. Electric trolley cars and street lights

recently had been introduced and the demand for power was rapidly increasing. The facility, located in an industrial area along the Mississippi River north of downtown St. Louis, was designed by the architectural firm of Mauran, Russell and Garden and built by contractors Goesse and Remmers at a cost of \$55,000.

The plant, which had an initial capacity of 1,500 kilowatts, was upgraded to a capacity of 4,500 kilowatts in 1906, the same year that Laclede sold the plant to Union Electric. The photograph is part of a National Register of Historic Places Nomination prepared by Lynn Josse of Landmarks Association of St. Louis. The original photo is on file with AmerenUE.

Send your photo to "Time Exposures," c/o [*Missouri Resources*](#), P.O. Box 176, Jefferson City, MO 65102-0176. All pictures will be returned via insured mail. Pre-1970 environmental and natural resource photos from Missouri will be considered. Please try to include the time and location of the picture, a brief description and any related historic details that might be of interest to our readers.

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Teacher's Notebook



Bridget Eisterhold (center), sixth grade science teacher at Thomas Jefferson Middle School in Jefferson City, explains to students (left to right) Gabby Stephan, Haleem Young, Bethany King and Grant Hopkins, the importance of earthworms to healthy soil.

by Judy Stinson

photograph by Scott Myers

So you are beginning a unit on soils. How comfortable do you feel teaching soils with the knowledge you have about the subject? How can you provide your students with activities that pique their curiosity and promote learning? You stop for a moment only to realize that you're not sure you can teach everything about this unit. Who are you going to call? Soil busters? Well, maybe not, but there are some individuals that are willing to come into your classroom and do a presentation designed to stress the importance of soil, discuss the important job that worms do for the soil, highlight soil conservation practices, introduce soil and water stewardship activities, or design a lesson geared to meet your students' needs. As a bonus, the students can crawl through a 4 foot by 8 foot worm tunnel created to teach students about the soil, its layers and those creatures that live underground.

For most third- and fourth-graders, the department's Soil and Water Conservation Program's presence in the classroom is a welcomed learning opportunity. Teachers also can contact their local soil and water districts for classroom presentations. There is no substitute for face-to-face, hands-on interaction with students to challenge them to blend the power and resources of a classroom assignment with real life. Students need to know that Missouri is a rural, urban, agricultural and industrial state. Whether eating cereal for breakfast or putting on pajamas at bedtime, everything a student needs or uses can be traced directly or indirectly to a natural resource, mainly soil, from the environment. Soil is one of our most natural resources.

From the soil we get food, clothing, and building materials for the homes we live in. Actions and

decisions students make about resource use can have a measurable impact on the environment.

Activities used in the classroom should be ones that encourage all students to participate. Students tend to learn better when engaged in the activity. This lesson allows students to get their hands dirty while learning about the different layers of the soil.

Soil Profiles

Objectives:

- Students will determine soil differences in relationship to depth.
- Students will explain how soils are actually formed.
- Students will name the different layers of the soil.

Activity 1:

Define profile. (A sideview of an object or structure, esp. of a human head) What would a soil profile consist of?

Opening questions: When you dig into the ground in your yard, you will find soil. What happens if you continue digging? If you dug far enough, would you run out of soil? How far would you have to dig before you ran out? What would you find there?

Soil Profile Components:

Soil horizons

Topsoil is:

- Full of life and humus
- Usually dark in color

Subsoil is:

- Usually lighter in color
- Higher in clay

Parent material is:

- Rock turning into soil

Bedrock is:

Rock that will eventually make soil

Discussion:

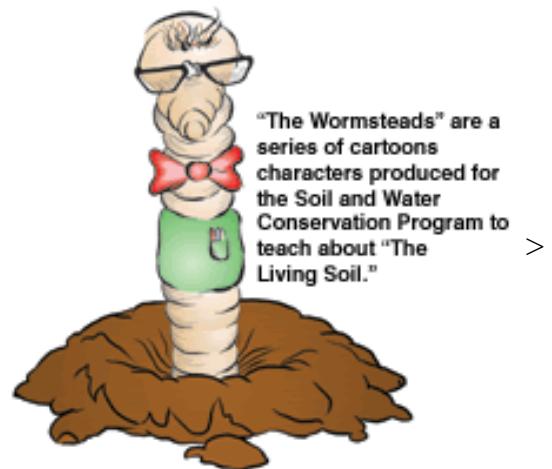
Where do you think most soil life exists? Why?

Why is soil important?

How to construct a miniature soil profile:

Building a miniature profile provides an excellent hands-on experience enabling students to learn about soil formation and development as well as several physical and biological properties of the soil. As with many hands-on student activities, the process is more important than the finished product. The construction of each horizon of the profile provides an excellent opportunity to learn about the development and properties of individual soil layers.

A simple method to construct a miniature soil profile is by using plastic slide holders and samples of soil and gravel to simulate the four major soil horizons. Eight and one-half by 11 inch slide holder sheets containing 20 pockets for 2 inch by 2 inch slides can be purchased from many office or photo supply stores. Cut sheets into five strips, each having four adjacent pockets. When each pocket is filled with a small amount of soil or rock, sealed, labeled (topsoil, subsoil, parent material, and bedrock), and held vertically, the student has created a facsimile soil profile that may have taken thousands of years to develop in nature.



Materials needed include:

- Slide holders cut in strips
- Adhesive labels
- Topsoil
- Subsoil
- Chat (mix with subsoil to simulate parent material)
- Small (one-fourth to three-eighths-inch) gravel (simulates bedrock)
- One-inch wide sealing tape
- Scissors
- Small spoons

Attach labels to individual pockets before adding soil. Only a small amount of topsoil, subsoil and parent material mix are needed and use only three or four small pieces of gravel to facilitate sealing the profiles. After each pocket contains the proper contents, seal with tape.

No matter how young or old the student may be, the department's Soil and Water Conservation Program believes in educating our youth. We promote our educational efforts through activities designed to encourage the development of independent thinkers able to make informed decisions about the environment. We all know that every generation's future rests with its children.

This activity was created and provided by Bill Bohnert and the Jackson County [Soil and Water Conservation District in Blue Springs](#). Judy Stinson is an environmental education specialist with the department's [Soil and Water Conservation Program](#).